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ABSTRACT

The Montgomery County, Maryland school district has a five-year plan to develop and install revised instructional systems in four major subjects. The components of the instructional system are: performance objectives for pupils, appropriate student placement based on performance, instructional guides for teachers, assessment tasks, and pupil progress reports for teachers and principals. A comprehensive training program to equip both the professional and support staff to implement the competency based program involved the determination of training needs, design and delivery of training, design evaluation, and implications for change or study. The assessment of training needs for teachers was made through analyses of teachers' needs, experiences, observations, and suggestions. The training program resulting from the assessment included: (1) staff orientation to the philosophy and nature of the new instructional program and the training program; (2) instruction of teachers and principals about placement tests, curriculum guides, reports, and assessments; (3) orientation of aides to their roles in the assessment process; (4) provision of activities to help teachers use the components of the instructional plan; (5) provision of activities to help principals use reports in program management; (6) demonstration of exemplary classroom management and instructional practices; and (7) assistance in helping participants to transfer their knowledge of components to application on the job. An evaluation of the overall design, actual training activities, and materials was conducted to secure information and data for further program improvement. The most significant aspect of the effort is the clear recognition and acceptance of formal training as a critical step in the program's implementation. Without such training support for staff, efforts to improve learning opportunities through new curricular designs are likely to fail. (CJ)

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IN-SERVICE TRAINING FOR CURRICULAR CHANGE: FOCUS ON DELIVERY OF INTEGRATED TRAINING FOR PRINCIPALS, TEACHERS, AND PARAPROFESSIONALS

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There is a growing concern among educators regarding the movement toward a more competency-based curriculum. While parents demand more for their money, educators are asked to be more "accountable," and with fewer tax dollars. Recognizing this concern, in Montgomery County, Maryland, a significant developmental effort was mounted in the fall of 1975, which is resulting in major curriculum revisions for the K-8 program in mathematics, language arts, science, and social studies. (1)

First, some background on this school system may be helpful. Montgomery County, Maryland, is situated to the northwest of Washington, D.C., between the Potomac and Patuxent Rivers. Its school district encompasses the entire county--about 500 square miles. The county's 186 elementary, middle, junior and senior high schools are administered as a single system. The seven-member elected Board of Education determines educational policies for the schools, and the superintendent and staff administer them. The district is divided into five geographic areas, each with an associate superintendent and various supporting personnel to aid teachers and administrators in carrying out the instructional program. About 7,000 professionals and 4,700

supporting employees serve approximately 108,000 students, making Montgomery County one of the nation's 20 largest schools districts.

In this district, a five-year plan was established to develop and install revised instructional systems in each of four major subjects. The newly revised K-8 mathematics curriculum was the focus of the inital year of the project. This curriculum is based on a set of clearly specified objectives organized in a hierarchy of achievement levels. The objectives are accompanied by criterion-referenced assessments, which are summarized through computerized reports on individual students and classes. This feedback process enables the teacher and school principal to plan appropriate instruction for each child in the classroom. The components of the instructional system are

1. Performance objectives for pupils
2. Appropriate placement of pupils based on performance
3. Instructional guides for teachers
4. Assessment tasks
5. Pupil progress reports for teachers and school principal

The purpose of this presentation is to describe a comprehensive training component to equip both the professional and support staff of the Montgomery County school district to fully implement this new program.

After the developmental period, the new curriculum was installed in fifteen schools on a pilot basis. During the 1976-77 pilot year, it became clear

that more extensive training and preparation of teachers and administrators was a necessity. This was particularly true since the new instructional system was scheduled to be phased into all elementary and middle/junior schools of the district during a five-year period. In the second year of the project, the Instructional System in Mathematics (ISM) was being extended into 18 additional schools, and in the third year, into 46 more. This paper describes the training provided for the staffs of these schools, to assure that the new math curriculum was adopted adequately in the fall of the 1978-79 school year. The Department of Staff Development, a central office department having the prime responsibility for the district's training programs, was given the task of coordinating the design and implementation of the training effort to support the ISM. This paper will describe the following facets of this major training effort:

I. Determination of the Training Needs

II. Design and Delivery of Training

III. Evaluation of the Design

IV. Implications

I. DETERMINATION OF THE TRAINING NEEDS

The assessment of training needs for teachers was approached in a number of ways. First, in 1977, the school system's coordinator of mathematics supplied his analysis of teachers' needs, based on his experience, observations, and teachers' suggestions during the first year of the pilot. Second, selected teachers who were in the ISM pilot were asked to provide their perceptions of training needs. Responding teachers provided information about the skills and knowledge teachers need for successful first-time

implementation. Additional suggestions were solicited that would be relevant to the projected training. Responses were categorized according to training need; then a representative group of teachers assisted a planning team which derived specific learning objectives from the training needs, and suggested appropriate learning activities with respect to each objective. Using this process, the design for teacher training evolved.

There was considerable congruence regarding the areas where training was needed. The most dominant teacher training needs were in the application of the following process skill areas to basic knowledge about the system and to the math curriculum:

1. Diagnosing learning needs
2. Grouping students
3. Teaching small groups
4. Classroom management
5. Assessing pupil progress

To determine the training needs of the school administrators, a meeting was conducted with principals of the 1976-77 pilot schools. They were asked to complete an instrument containing 95 specific performance tasks, rating the importance of each skill with respect to the effective implementation of the new instructional system. Participants also rated each skill with respect to effective school administration in general. In addition, participants were asked to list specific barriers they faced in implementation of the new system, and topics which should be included in the training being designed. Representatives from the Department of Curriculum and Instruction also completed the instrument. All responses to this instrument were tallied and were used as the basis for the training program design.

Using the above approach, 75 performance tasks were selected within the following areas, which were used to design training activities for principals and assistant principals.

1. Understanding the structure, purpose and operation of the instructional system
2. Planning and organizing
3. Coordinating, monitoring, and evaluating
4. Decision making and problem solving
5. Communicating and human interaction
6. Managing organizational change and self-renewal (1)

Since training in the process skills was identified as the greatest need, the objective for training was a design that would demonstrate the application of those teaching processes (diagnosing, grouping, classroom management, assessment) to a curriculum content area (math), with the support of technology (computer assessments, reports). Since all teachers could not receive this intensive training, it was also necessary to assure the most effective dissemination. The orientation and training program designed in 1977 represented an attempt to use a few intensively trained teachers and the principal in each school as agents to link the model with actual implementation in the classroom. The program consisted of a) an orientation to the system for all teachers and principals, b) intensive training for selected teachers and principals, c) assistance for all teachers in the use of components. This training plan was carried out in a summer demonstration center. During the ensuing year, we sought an evaluation of the effectiveness of that model from the participants, who by that time had had several months' experience with ISM. Thus, the design for training of school staffs

in 1978-79 grew out of three sources of data: (1) evaluation and feedback from teachers and principals who had participated in training during the summer of 1977; (2) evaluations from the design group and reactions of the trainers, area math specialists, and the coordinator of administrative training to the experience from the preceding year; and (3) the practical constraints of scheduling, budgeted resources, human resources, and the Negotiated Agreement with the teachers' bargaining agent.

It is important to credit the client group of teachers and principals, who were a major source of data for many of the elements of the program. As I said earlier, we had attempted in the summer of 1977 to train a nucleus of the school staff -- principal and two or three teachers -- as a link between other teachers and area specialists. That small group (55 teachers, 18 principals) said that, while their own training was excellent, they were not used effectively as linking agents. They recommended instead that the training provided to them in a demonstration center be made available to all teachers who would be expected to use the ISM. The reason voiced for this recommendation was that observation of and interaction with the demonstration teachers, who were actually using the ISM during the summer-school period, was invaluable to them in conceptualizing how they would implement and integrate ISM into their own regular school program. Thus, there was a a client group of 23 principals and 300-350 teachers who would be required to implement ISM in the fall of 1978.

Another strong recommendation from the group related to the span of training time. They were in favor of activities spaced over several months that would include the time prior to and during the initial implementation phase.

Principals asked for more "hands-on" activities in their training. Teachers thought the critical elements of their training could have been accomplished in less time (than nine days). In brief, as a result of such feedback, a plan was developed for a seven-day program for teachers and principals.

Until 1978, the aide assigned to each ISM school to manage the assessment process had received training in the fall. A few half-days were designated in September, aides were called in from the schools, and they received a group orientation to their role in the ISM program. The Department of Staff Development was asked to coordinate training in 1978 for aides as well as for teachers and principals. A plan was devised to integrate this component into the general design. Using information from aides and program managers regarding the specific objectives to be met, we developed a four-day program for aides integrated with the teacher and principal program.

II. Design and Delivery of Training

A. The explicit objectives of the plan can be summarized as follows:

1. To orient teachers, principals, and aides new to ISM to the philosophy and nature of the System and to the training plan
2. To familiarize teachers and principals with the nature and use of placement tests, curriculum guides, reports, assessments, and computer terminals
3. To familiarize aides with their role in the assessment process
4. To provide activities to help teachers use the components in an instructional plan

5. To provide activities to help principals use reports in program management
6. To demonstrate exemplary classroom management and instructional practices for ISM
7. To demonstrate how reports are used to diagnose and assess student learning
8. To demonstrate the assessment process
9. To assist participants in transferring their knowledge of components to their application of it on the job.

The framework developed by the design team is represented below:

May	June	July	August	Oct.-Nov.
One-half day: Overview of ISM Introduction to training plan	Two days: Use of Curriculum Guides Using reports Assessments Terminals	Three days: Implementation of ISM in a Demonstration Center 300 Teachers 23 principals 23 aides	One-half day: Review Reinforcement Update Aides: two half-days	Two half-days: Use of profile Grading and reporting
In schools	In Center		In schools	In schools

To implement the half-day sessions, approval was given to release pupils in the afternoon, and area math specialists helped to organize the training on a school or area basis. The design team selected a school facility in which to implement the two- and three-day sessions after schools closed in June

and July. Reviewing all the criteria and options, the group recommended a junior high school which was equipped with computer terminal installations. A three-member training team was employed to coordinate and conduct training activities. Area math specialists assisted greatly in the June sessions, and to a limited extent in the July sessions. Classroom teachers were paid a training stipend ($45.00/day) to attend the summer sessions. Throughout, principals and teachers attended training sessions together, with job-alike groups meeting separately at times. To complete the design, aide training in the demonstration center took place during a single three-day period in July, and the aides who attended were paid a training stipend ($25.00/day). Setting up a demonstration center is very much like opening a new school. Staff (principal, teachers, aide) must be selected carefully so as to represent ISM at its best. Textbooks, manipulatives, and other school supplies must be procured; training materials to use with teachers must be purchased, organized, or created. This process was carried out in April, May, and June, as soon as the use of the site was confirmed.

Using the framework and objectives given above, detailed plans were drawn for days, hours, and sessions. The five-stage training is described briefly below to amplify the figure on page 9.

Stage 1 (May - June 1978) Staff in incoming schools received an orientation to the philosophy and nature of the ISM from area math specialists, using appropriate slides and an adaptable script. One Central Office representative described the plans for the next four stages of the training, with a large portion of the questions and discussion focused on program and attendance at June and July sessions.

Math specialists used placement tests to orient teachers and principals to the nature and use of the tests, and teachers selected the appropriate placement tests for their students.

Stage 2 (June, after close of school) Each teacher and principal participated in a two-day program in which the three primary trainers were assisted by area math specialists. Trainers presented curriculum guides, assessments, and reports. Participants learned how to use computer terminals, how and when to assess students, and how to use reports. Principals learned how to use the ISM components as tools for program management. Three groups accommodated the 297 participants at the Center:

Group 1 -- June 22-23

Group 2 -- June 26-27

Group 3 -- -June 28-29

Stage 3 (July 10-28; six three-day sessions) Each teacher, principal, and aide was offered the opportunity to spend three days in the Demonstration Center with approximately 50 others, observing instructional and assessment practices, analyzing teacher and aide practices, extending their knowledge of components, and applying it to structured training experiences. Six groups of 50 teachers and 3 or 4 principals in each group were planned; 236 teachers, 23 principals, and 18 aides attended while the summer school was in session. Trainers worked with teachers at three levels: primary (K-1-2); intermediate (3-4-5); and middle/junior high (6-7-8). This stage of the training was unquestionably the most difficult to deliver, and, as evaluations demonstrated, the most productive. (The description of the Demonstration Center that

follows is the script of a slide/tape presentation that accompanied this presentation.)

The Summer Demonstration Center for Instructional Systems Math included classes for students in Grades 1 through 8 grouped by developmental level. The primary classes were composed of students who had completed kindergarten and grade 1, or, in a few instances, Grade 2. Students from Grades 2, 3, and 4 formed the intermediate group, and those for Grades 4 and 5 constituted the upper group. Finally, students who had completed Grades 6 and 7 and those in Grade 8 formed two middle or junior high school classes. Two teachers, selected for their experience and competence in teaching ISM, shared responsibility for each class of 50 students.

The Demonstration Center was organized in cooperation with the Summer School Office. Students were accepted on a "first come, first served" basis upon receipt of an application and the standard summer school fee of $22. Any child who would ordinarily be placed in a regular classroom was accepted; therefore, center teachers needed to plan for gifted children, average students, and slow learners within the same class. Students attended the center 3½ hours each morning for 20 days. Both math and language arts activities were scheduled concurrently all morning long. This arrangement ensured that any time teachers-in-training visited a classroom, they would be able to see some math activity. In addition, the simultaneous scheduling assured that each student would have a balance of math and language arts instruction. This carefully considered arrangement reflected an important belief about classroom management at the elementary and junior high levels.

It required center teachers to plan small-group instruction according to specific objectives needed for individual students; it allowed time for instruction and individual practice on specific skills each day; and it promoted team teaching. Teachers were joined on the center staff by an aide who managed the assessment process and a principal who was experienced in managing an ISM school.

The entire staff carried a staff development responsibility. Teachers demonstrated the use of all components for ISM:

They gave placement tests to new students;

They discussed with teachers-in-training how each day's lessons were planned;

They used computerized reports called class profiles to group together students needing to work on a specific objective;

They used manipulative materials where appropriate; and

They assessed student progress either by demonstration with an aide, by paper and pencil, or with computer terminals.

The principal's role in the staff development process included meeting with principals who were new to the system and addressing their questions and concerns about the introduction of ISM into their local schools. The Aide demonstrated for teachers, principals, and newly assigned aides the process of managing assessments. One of the fears of teachers entering ISM was that the computer would take over their instructional role. Seeing students using the terminals for assessment, their excitement in demonstrating mastery of an objective, and the speed with which that mastery became a part of the student's record--all helped teachers conceptualize the role of the

computer in this new system as a support for instruction rather than as a replacement.

The training plan included the three categories of school staff: teachers, principals, and aides. Prior to visiting the Center for three days, teachers and principals completed a two-day orientation to all of the components, without students being present. They became familiar with new instructional guides; they learned how to use class profiles for grouping students; they learned how and when to provide assessments; they learned the role of the aide and the computer; and they became adept, themselves, at using the terminals. The Center was used to show how a teacher uses all of the components together as a system. Principals joined the teachers training sessions to gain an understanding of the teacher's role in ISM. They also met in sessions apart from teachers to learn about managing the Instructional System and to gain answers to questions pertinent only to the principals.

New aides attended the Center for three days to learn about their role in managing the assessments. They had opportunities to practice their new tasks by conducting demonstration assessments with students under the supervision of trainers and experienced aides.

Three primary trainers--one from each level of instruction--managed the training plans. They had assistance from demonstration teachers and brought in as consultants other classroom teachers experienced in using ISM. The 300 teachers and principals--in six groups of about 50 each--came to the Center for three days. Each morning, participants spent about 45 minutes

observing classrooms for specific purposes. In addition, they worked on planning activities, observed students being assessed, and talked with classroom teachers who had been new to the Instructional System the year before. After the students left, participants spent about an hour with the demonstration teachers whose classes they had observed--analyzing, questioning, and planning.

Clarification of how to integrate ISM into the regular instructional day came from these observations and from teachers' analyses of them with the demonstration teachers. Afternoon sessions included discussion of diagnostic activities and techniques for classroom management. Here participants received data from their schools' placement tests given the preceding spring, in order to gain insight into their own students' mastery levels and how they might best be grouped. Participants also observed a parent orientation session and conferred with teachers on the implications of the ISM for reporting student progress to parents. In addition, participants had an opportunity to look at classroom management models other than those demonstrated in the Center.

As knowledge about ISM grew, much of the fear and apprehension diminished. Enthusiasm generated by students in the Center demonstrated that the new system did not destroy their interest; and respect for demonstration teachers helped many teachers believe that they, too, could make the system work.

The final evaluation sessions revealed that the staff left with increasing confidence that they would be able to manage the new system in the fall successfully for their students.

Stage 4 (August 29 - September 1-Professional Days for Teachers) September 6-7 (for Aides) During one-half day of the four professional days allotted, teachers in their local school or in school groups with the math specialist who is serving that school had assistance in making final plans for the school year. Specialists took time to update teachers on changes in curriculum guides and changes in ISM; to introduce new materials; and to offer help as requested. Computer-related-instruction specialists visited their new computer schools during that week, as well. Each aide had two days of training on the new data base, and on using terminals to assess or update records. In addition, teachers who had not attended summer training activities met with math specialists for an additional half day during that week; math specialists made plans for individual help throughout the early weeks to their teachers in that group.

Stage 5 (Planned for late October, early November 1978) This final stage of the plan was designed to

(1) assist teachers in solving unanticipated ISM implementation problems

(2) assist teachers in interpreting their first class profiles and in using them to regroup students and sequence instruction

(3) assist teachers in relating the grading and reporting policy to ISM.

III. EVALUATION OF THE TRAINING DESIGN

The training design described in the preceding section of this paper was prepared as a result of careful planning based on the needs of teachers and administrators. However, the actual Institute and other training activities

outlined here were done for the first time, beginning in the spring of 1977, and changed in 1978. As such, the training component is most appropriately viewed as a program still in a "field test" stage. The evaluation of the overall design, actual training activities, and materials, was conducted primarily to secure information and data for further program improvement. Information was secured from participants in two ways. First, each participant in the summer Institute was asked to keep a daily log noting his/her attitudes, significant learnings, questions or problems. The logs were submitted daily for review and response from the leaders of the Institute. Throughout the Institute, participants' daily logs showed a consistent trend away from initial apprehension and negative attitudes towards positive, sometimes enthusiastic, attitudes about the program.

Second, participants were asked to respond to a variety of questionnaires, providing specific responses to questions regarding aspects of the program. For example, at the conclusion of Stage 3 of the program, participants in the Institute were asked to indicate their familiarity and confidence with the nature and use of each of the ISM components, provide suggestions for Institute modifications, and indicate their attitudes and feelings concerning the training. In their final evaluation, participants were generous in praise for the design and organization of the training; a few thought they needed less time to accomplish objectives. A summary of 260 responses indicates that participants' evaluations paralleled those of the preceding summer. Some of the highlights are given below, with participants' values given in priority order:

1. the interaction in small groups with trainers and demonstration teachers

2. classroom observations in the demonstration center
3. overview of components (guides, printouts, assessments)
4. use of special resource people who presented techniques for diagnosis, classroom management, and teaching techniques.

Using a six-point scale (0-5), the average of participants' ratings of their confidence in using components was represented as follows:

Placement tests	3.6
Class profiles	3.5
Student profile	4.0
Monthly Assessment Report	3.6
Instructional Guides	4.1
Assessment Tasks	3.8

Comments of participants were generally laudatory and enthusiastic about the training experience. We held evaluative sessions with teaching and training staff, as well, and all identified areas where improvement could be made.

A follow-up evaluation is planned with principals, teachers, and aides in the project again to solicit their thoughts on the effectiveness of the training from their perspective at that time. It should then be possible to measure effects of the process skills demonstrated in the summer and whether or not teachers and administrators are able to perform the specific tasks required of the instructional system.

IV. IMPLICATIONS

We have attemped to provide in some detail an example of a training support system for a high priority curriculum implementation effort. When school districts make an attempt to install major changes in the curriculum, adequate training and preparation of staff is a necessity. The supportive training effort outlined in this paper represents a substantial investment in time and money. For example, the released time for orientation and preparation of the teaching staffs amounted to about two days per teacher. Preparation for Stages 2 and 3 alone required about forty days of development. Nearly 300 teachers received a stipend to participate in five days of careful orientation and hands-on training, and 18 aides received a stipend for three days. Instruction and materials for the Institute added to the cost. Much of this formal training took place before the school year began, and further follow-up training is being conducted for teachers and administrative staffs during the coming year. It is clear from this experience that the school system administration must provide strong financial support to make such training possible.

An in-service training program should recognize that each participant already possesses a certain level of skill and proficiency, determined through assessment and diagnosis. Thus, the training can model the underlying principles of the instructional system with modifications for individual differences among the program participants.

From a training perspective, the most significant aspect of the effort is the clear recognition and acceptance of formal training as a critical and necessary step in the implementation of new instructional systems. The

support for this intensive training came directly from the Board and top executives of the school district. Without such training support for teachers and administrators, efforts to improve learning opportunities through new curricular designs are likely to fail. We are beginning to learn that training is not a "fringe benefit"; rather, the professional development described here represents an integral component in the improvement of educational experiences of youth. (1)

(1) The author acknowledges the contributions to this portion of the paper of A. Bruce McKay, Coordinator, Administrative Training Programs, Department of Staff Development, Montgomery County Public Schools. This portion appeared earlier in similar form in a locally published paper: "In-service Training for Curricular Change." by A. Bruce McKay and Marilyn E. Nelson (1977).